

# SASOL NORTH AMERICA INC.

## PRODUCT DEVELOPMENT, MODIFICATION, AND PRIORITIZATION PROCESS

This is a summary of Sasol North America (SNA)'s Product Development, Modification and Prioritization Process which ensures that SNA products are developed, manufactured, and used in accordance with regulatory requirements, with documented consideration of product hazards and distributed with effective warnings. This is our fundamental process for characterizing and managing product risk. The prioritization aspect of the process is the process that SNA will use to prioritize the chemicals we produce for risk communication activities.

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### SCOPE OF THE PROCESS

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Any product undergoing development or modification lies within the general scope of this process. This includes any entirely new molecules, any product from a new or modified process, new distillation cuts or isolated process streams, and any product isolated or separated from an existing product or material. Any activity that can change the risks associated with the manufacture, handling and use of the product is also included within the scope of the process.

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### LEVEL I AND II PDMP REVIEWS

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**Level I (experimental/developmental) reviews** are preliminary reviews conducted prior to commercial commitment to the product (typically, before or during sampling) that are initiated by a researcher or other project initiator. The purpose of these reviews is to define the regulatory requirements for the product in question, characterize its hazards and to identify any appropriate risk management actions. In some cases, additional hazard information and use data may be required and will be specified. Many of these issues may have significant impact on the decision to continue with commercialization of the product.

**Level II (pre-commercialization) reviews are final reviews** conducted prior to commercial production of a product. Reviews are initiated by the product manager or designee to assure that all the appropriate issues associated with the commercialization of the product have been addressed. These include a documented hazard review and development of hazard communication materials.

Composition, physio-chemical properties, ecological fate and effects, and toxicological information are evaluated against the Sasol Minimum Dataset Criteria to determine whether any additional data is needed. Potential risks are screened by comparing the hazard data with that of similar materials with a safe history of use in similar applications. If the comparison indicates any concern for product use, a more detailed evaluation takes place, including more specific analyses of hazard and exposure potential. Finally, any necessary requirements for personal protective equipment, restricted sales procedures, applicable regulatory restrictions and other exposure control measures are then incorporated into the overall risk management program for the product.

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### PERSONNEL INVOLVED IN THE PROCESS

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- I. PRODUCT MANAGER** - Product Managers are responsible for the conduct of the PDMP process within their respective product areas. This specifically includes seeing that a PDMP level II review has been initiated in sufficient time to address any issues when a decision is made to go past the experimental stage to produce a commercial product. Various employees and departments assist the Product Manager in this process.

- II. SENIOR PRODUCT SAFETY SPECIALIST, CORPORATE RESPONSIBLE CARE DEPARTMENT** - Gathers the required information and documentation for this process and maintains it in a central product information file. In conjunction with the appropriate Product Steward, the Senior Product Safety Specialist coordinates a periodic audit of the new product files for each material subject to this review process.
- III. PRODUCT STEWARD** - The Product Steward develops physical and chemical data for the new product development activity as appropriate to the type of change and assures that all new validated data is entered into the Product Information Database (PrIDE) system. Where documentation is incomplete the Product Steward works with the Product Safety Specialist to resolve data gaps.
- IV. RESEARCHER OR DEVELOPMENTAL ACTIVITY INITIATOR** - The "researcher" or "developmental activity initiator" is responsible for assuring that the experimental Material Safety Data Sheets, EPA Chemical Inventory Status, and PDMP Level I reviews are conducted as appropriate for developmental products. The "researcher" or "initiator" is typically an individual who is directly involved in the development of the product or the production of the initial samples or test run. This is typically a staff person in R&D, or a chemist in a plant laboratory, but could also be the Product Manager.
- V. MANUFACTURING LOCATIONS** - The manufacturing locations have processes in place through Process Safety Management of Change and Hazard Communication programs that identify or manage product development and modification activities impacting their locations. There are also post development activities such as exposure assessments and training that may occur after a new or modified product is in production.

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### WHEN WE USE THE PDMP PROCESS

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The decision to commit the resources necessary to execute the various elements of this process must be guided by judgment of the inherent risks of the product, the ability to manage those risks, its commercial value product and any timing requirements.

- I. EXPERIMENTAL/DEVELOPMENTAL PRODUCTS (LEVEL I REVIEWS)** - Level I reviews should be conducted in sufficient time to assure that developmental products with "commercial" potential are assessed at an early stage to assure timely development of data required for hazard assessments and regulatory classifications. Typically, Level I reviews should be conducted whenever a material requires a new experimental MSDS, a customer asks for additional samples, a large volume is being shipped (tank car), a customer asks for pricing and availability in writing or SNA wants to expedite the product to market.
- II. PRIOR TO COMMERCIALIZATION (LEVEL II REVIEWS)** - Based on experience, the Product Manager may decide to initiate Level II reviews only for those developmental products that have been evaluated by customers and for which additional sampling is anticipated. It is up to the judgment of the Product Managers to determine how to manage this process in their respective business areas and when to initiate the additional review activities in this level.

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### CHECKS AND BALANCES

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A Level II PDMP review must be completed prior to the product being entered in our commercial product management system. A system entry request form arriving in the Corporate SH&E Department for a product that has not undergone a PDMP Level II review will initiate questions and possibly delay entry.

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## ADDITIONAL SUPPLY CHAIN PRODUCT RISK MANAGEMENT PROCESSES

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When a product has been put into commerce we continue to review the activities associated with its movement through the supply chain and we periodically review existing products to be sure we have the appropriate risk management actions in place.

- I. Distributor Review Process:** This process is administered by Marketing in cooperation with the SHE group and involves screening questionnaires and site visits. The process is initiated prior to using a distributor.
- II. Ex Plant Operations SHEQ Review Process:** This process includes product terminals, contract packagers and manufacturers. It is a quantifiable process and is applied prior to use and periodically thereafter. The scope includes Safety, Health and Environmental practices as well as security elements of the operations
- III. Product Stewardship Review Process:** This process includes nearly all groups of the company including R&D, Manufacturing, Marketing, SHE, and Logistics. It is designed to review the SHE attributes and risk characterizations of existing products including customer feedback on use conditions, employee, and regulatory issues at the point of manufacture and distribution.

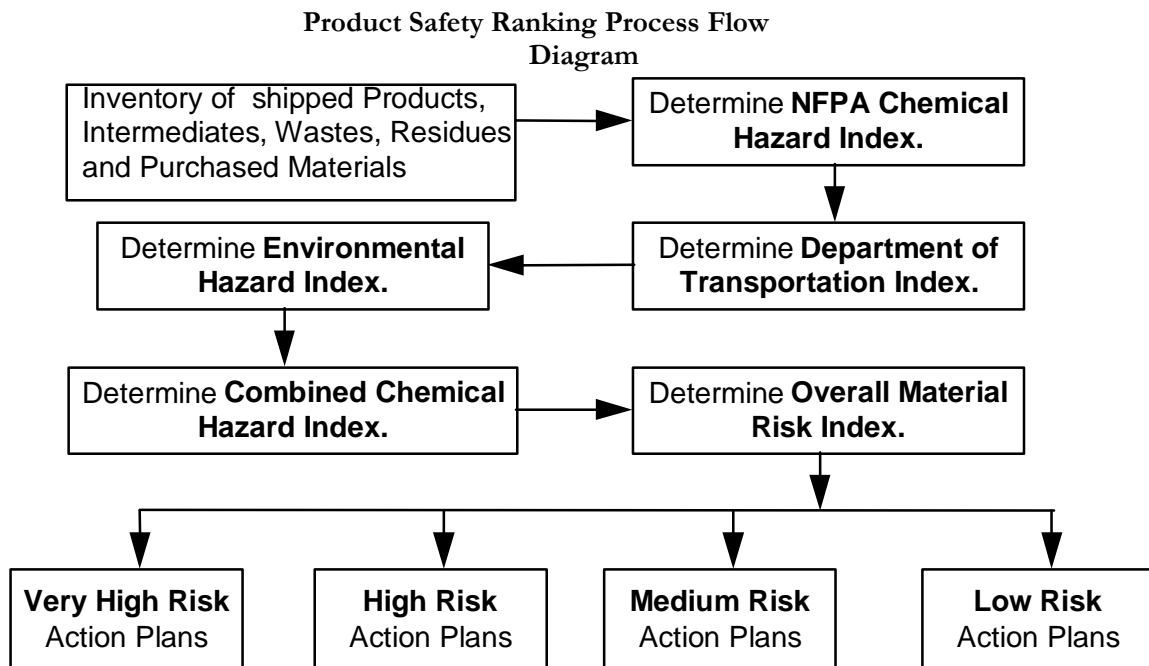
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## Chemical Prioritization Process

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Sasol North America will initially prioritize current commercial products, develop chemical summaries for these products and make the summaries available to the public. New chemicals will be assessed on an ongoing basis as part of the PDMP II review process. The following rankings will be assigned to each chemical.

- Priority 1 - High Production Volume Chemicals
- Priority 2 - Extended High Production Volume Chemicals
- Priority 3 - Very High Risk Chemicals (based on process summarized below)
- Priority 4 - High Risk Chemicals (based on process summarized below)
- Priority 5 - Medium Risk (based on process summarized below)
- Priority 6 - Low Risk (based on process summarized below)



The index numbers are determined as described below:

### NFPA CHEMICAL HAZARD INDEX

Use the MSDS to identify the three NFPA rating numbers (Health, Reactivity, and Fire). If there is a rating of “3” or “4” for either Health, Reactivity, and Fire, Sasol North America’s practice is to designate the NFPA Chemical Hazard Index as “high” or “very high”, respectively. Otherwise, add the three NFPA rating numbers. Use the following table to determine the NFPA Chemical Hazard Index based on the sum of the three numbers

Sum of NFPA Rating Numbers	NFPA Chemical Hazard Index
10 – 12	Very High
7 – 9	High
4 – 6	Medium
0 – 3	Low

### DEPARTMENT OF TRANSPORTATION INDEX

Use the product's MSDS to identify the DOT Packing Group. Use the following table to determine the DOT Hazard Index based on the DOT Packing Group.

DOT PACKAGING GROUP CLASSIFICATION	DOT INDEX
Packaging Group 1: Poisonous by Inhalation OR Pressurized Flammable Gas	Very High
Packaging Group II: when the material is either Dangerous When Wet OR when the material is Temperature Controlled (Refrigerated)	High
Packaging Group II: all others not listed above OR Packaging Group III: when the material is HOT	Medium
Packaging Group III: Not Regulated AND the material is NOT HOT	Low

### COMBINED CHEMICAL HAZARD INDEX

The Combined Chemical Hazard Index is determined from the NFPA Chemical Hazard Index and the DOT Index (see 6.2 and 6.3 above). Use the following table to determine the Combined Chemical Hazard Index.

NFPA Chemical Hazard Index	COMBINED CHEMICAL HAZARD INDEX			
Very High	Medium	High	Very High	Very High
High	Medium	High	High	Very High
Medium	Low	Medium	High	High
Low	Low	Low	Medium	High
DOT Index	Low	Medium	High	Very High

### ENVIRONMENTAL HAZARD INDEX

This index measures the relative environmental impact of the material's release during an event. Use the MSDS to identify each product or components for mixtures, Reportable Quantities (RQ) and Marine Pollutant status. Use the RQ for the component that has the most severe impact if it is released from an individual package (drum, truck tank, or rail car). Note that a component with a low RQ has a greater potential impact than a component with a higher RQ. Use the Marine Pollutant status for the component that has the most severe impact if it is released from an individual package (drum, truck tank, or rail car). Use the combination of RQ and Marine Pollutant status to determine the Environmental Hazard Index in the following table.

RQ AND MARINE POLLUTANT STATUS	ENVIRONMENTAL HAZARD INDEX
RQ: 1 - 9 lb OR Severe Marine Pollutant	Very High
RQ: 10 - 99 lb. OR Marine Pollutant	High
RQ: 100 - 999 lb.	Medium
RQ: more than 1000 lb. or none	Low

**OVERALL MATERIAL RISK INDEX**

Use the Combined Chemical Hazard Index and the Environmental Index in the following table to determine the Overall Material Risk Index.

<b>Environmental Index</b>	<b>OVERALL MATERIAL RISK INDEX</b>			
Very High	Very High	Very High	Very High	Very High
High	High	High	Very High	Very High
Medium	Medium	Medium	High	Very High
Low	Low	Medium	High	Very High
Combined Chemical Hazard Index	Low	Medium	High	Very High